Violations Severity Assessment Study

(VSAS)

Richard Gruberg
Analysis Division

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VSAS Research Questions

- Are particular violations of the Federal Motor Carrier Safety Regulations more likely to cause a crash than other violations?
- If yes, which violations are associated with increased crash risk, and to what extent?

Current Weighting of Violations

- FMCSA currently weights certain violations more heavily than others in SafeStat and during a Safety Fitness Determination (SFD).
- *During the SFD process, FMCSA only distinguishes between "Critical" and "Acute" violations, and does this only for a small number of violations (49 CFR, Part 385 – Safety Fitness Procedures).*

Potential Applications

- New CSA 2010 Safety Performance Measurement System (replacing SafeStat)
- Estimating number of crashes prevented as a result of Agency's roadside inspection program

VSAS Methodology

- For roadside violations:
  - Looked at how frequently particular violations were found during post-crash inspections in comparison to traditional roadside inspections at weigh stations
- For compliance review (CR) violations:
  - Looked at correlations between the CR violations and the roadside violations

Severity Risk

- Also looked at how particular violations may increase the severity of a crash
- Compared the average cost of crashes having the violation with the average cost of all crashes

Roadside Data Special Case: Traffic Enforcement Violations

- Cannot check for traffic enforcement violations (eg., speeding) during most routine roadside inspections
- Used data from WA state to measure the frequency of speeding in the baseline population
- Then used estimates for speeding in baseline population as proxies for other driving behaviors

Regulations Cited in MCMIS 2003-2006

Regulation Type	Violation Type			Total
	Admin.	Driver	Vehicle	
General Roadside	30	74	329	433
Hazardous Materials	5	21	388	414
Traffic Enforcement	–	24	3	27
Passenger Carrier	4	12	27	43
All Types	39	131	747	917

Incidence Threshold

Regs Cited > 10 times
(Both Roadside and Post-Crash)

Regulation Type	Regulations Meeting Incidence Data Threshold	Percent of Cited Regulations Meeting Incidence Threshold
General Roadside	251	58%
Hazardous Materials	17	4%
Traffic Enforcement	18	67%
Passenger Carrier	–	0%
All Types	286	31%

Regulations with Positive and Significant Incremental Risk

Regulation Type	Incidence Threshold Met	Incremental Incidence Factor Positive	Incremental Incidence Factor Positive and Significant
General Roadside	251	133	106
Hazardous Materials	17	5	2
Traffic Enforcement	18	15	14
Passenger Carrier	0	0	0
All Types	286	153	122

Top Roadside Violations for Crash Risk

Type	Violation Description	Incremental Crash Incidence Factor
Traffic Enforcement	Failure to use caution for hazardous conditions	13,923
Traffic Enforcement	Reckless driving	12,705
Traffic Enforcement	Operating CMV with ill or fatigued driver	7,280
Traffic Enforcement	Improper turns	3,037
General Roadside	Failure to properly secure paper rolls	2,571
Traffic Enforcement	Failure to yield right of way	2,339
General Roadside	Failure to prevent cargo shifting	1,730
Traffic Enforcement	Improper lane change	1,666
General Roadside	Improper towbar for driveaway/towaway	1,494
General Roadside	Driving a CMV within 4 hrs of using alcohol	1,464

Regs with Highest Total Risk (crash + severity risk)

Type	Violation Description	Incremental Violation Risk
Traffic Enforcement	Failure to use caution for hazardous conditions	$ 3,014,706,000
Traffic Enforcement	Reckless driving	$ 2,750,978,000
Traffic Enforcement	Operating CMV with ill or fatigued driver	$ 1,576,387,000
Traffic Enforcement	Improper turns	$ 657,559,000
General Roadside	Failure to properly secure paper rolls	$ 556,681,000
Traffic Enforcement	Failure to yield right of way	$ 506,507,000
General Roadside	Operating CMV with missing side windows	$ 428,898,000
General Roadside	Failure to prevent cargo shifting	$ 374,649,000
Traffic Enforcement	Improper lane change	$ 360,747,000
General Roadside	Improper towbar for driveaway/towaway	$ 323,502,000

Next Steps

- Complete Peer Review
- Present results to CSA 2010
- Conduct further research

Questions?

Richard Gruberg

Richard.Gruberg@dot.gov

202-366-2959